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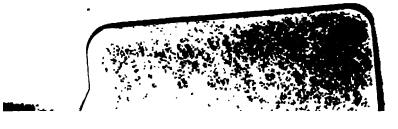

NATIONAL

HEALTH AND WEALTH,

INSTEAD OF

THE DISEASE, NUISANCE, EXPENSE, AND WASTE,

CAUSED BY

CESS-POOLS AND WATER-DRAINAGE.

A NEW EDITION.

BY

THE REV. HENRY MOULE,

VICAR OF FORDINGTON, DORSET.

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NATIONAL HEALTH AND WEALTH,

ETC.

SOME apology may be needed for my subject and for myself, as a clergyman, thus writing on it. Its importance must excuse its unpleasantness. And for myself, the position of my house, and of the town of Dorchester, on a chalk stratum, once honeycombed, as I suppose the site of all such towns is, by cess-pools, the works in progress under the Board of Health for draining the town, and the painful circumstances of a portion of my parish already before the public, have compelled me to devote hours to this subject which might well have been given to recreation after the arduous duties of my ministry. And, if I have thus been led to the discovery of a mode of remedying the evils both of cess-pools and of water-drainage,—a mode by which the enormous nuisances of both systems can be effectually relieved, by which such sources of sickness and disease can be cut off, by which the vast sums spent on town drainage can be saved, and the extravagant waste occasioned by it prevented,—then, to be silent because of the nastiness of the subject would be false delicacy, and still more would it be a neglect of duty towards my neighbour and my country. I am one of those, moreover, who see a marked action and re-action between moral and spiritual evil on the one side, and physical evil on the other; and who, therefore, regard

it as quite within the province of a clergyman to bestow a portion of his time and attention on such evils and on their remedy.

The cess-pool and privy vault are simply an unnatural abomination. People boasting of civilisation and cleanliness are accustomed to it, and therefore they still to a great extent endure such a mode of removing filth. With the one object of getting offensive matter out of sight, they form so many treasure-houses of bad smells and noxious gases, so many sources of disease and death; and, at the same time, waste the most natural and effective fertilizer of the soil.

The water-closet, used in connection with the cess-pool, has only increased these evils. It affords convenience, but the evil of noxious gases is increased and brought nearer home, and the water, causing the excreta more readily to percolate the subsoil, frequently thus poisons the neighbouring well.

Again, in the system of the water-closet combined with water-drainage, these evils are only shifted: they cannot be said to be remedied. The individual house and premises may be relieved from the presence of filth, but it is at the expense of spreading it through the sewers of the town, and of sending the noxious gases through the gully-holes and ventilators into the midst of the population; those gases, too, being rendered more noxious by the spontaneous fermentation of organic substances when mixed with water. The town may still in various ways be relieved; but it is at the expense of the neighbourhood through which the stream or river that receives this sewage may pass. And while the sums spent on this system are vast, and the waste of valuable manure by its means almost incalculable, this too much boasted remedy already calls for the application of remedial measures! For, let any one look first at these

facts stated by the Royal Commission on Town Sewage in their Preliminary Report:—

1. "The increasing offensiveness of the Medlock and Irwell at Manchester, of the Mersey at Stockport, of the Tame at Birmingham, and of many other rivers, proves that a *national evil* is fast growing up which *demands immediate and serious attention.* The last-named river, ... a small stream in itself, may be said, without exaggeration, during dry seasons to contain at Birmingham as much sewage as water," &c., &c.

"The Thames, which at a high point is supposed to yield a supply of pure water to London, before it reaches the recently adopted point above the tidal influence receives the sewage and drainage water of towns and villages containing more than seven hundred thousand inhabitants. In the great majority of these places little or nothing has yet been done with a view to the improvement of the public health: but, looking *at the rapid extension of drainage operations*, it will readily be conceived that, in the absence of general measures to prevent the pollution of rivers, *the state of the Thames will soon become seriously affected even by the sewage of those places alone.*"—pp. 9, 10.

From these, and similar facts, with further details of their effect on the health of such towns, the Commissioners arrive at several conclusions; let serious attention be given to these two:—

1st. "That the increasing pollution of the rivers and streams of the country is an evil of *national importance*, which *urgently demands the application of remedial measures.*" . . . . . .

2nd. "That this evil *has largely increased with the growing cleanliness and internal improvement of towns as regards water supply and drainage;* that *its increase* will continue to *be in direct proportion to such improvements!!* and that, as these

improvements are yet very partial, the influence of sewage, *already very sensibly felt*, is *extremely slight* as compared to what it will become *when sewage and drainage works* have been *carried into full effect.*"

And here I must insert a fact of which only within the last month (September, 1866) I became cognisant. The river Calder receives through the Hebble much of the filth of the borough of Halifax with its population of upwards of 30,000 souls. As it flows on to Wakefield several smaller places pour their filth into its waters, until at Wakefield it receives the contributions of a population of 26,000 souls. Four miles below this town a water company pumps the water, to be sent back filtered, indeed, but not rendered wholesome, for the inhabitants of that town to drink.

Let the reader turn back from this to the expressions used by the Commissioners above referred to: *Growing cleanliness and sanitary improvements the sources of a largely increasing national evil!* There surely must here be something wrong—something that will admit of no palliative. And one wonders that the very next conclusion to those given above was not this,—That the system which originates such an evil must be changed altogether; that, after all, water is not the great purifier of our houses, and that the great object of our endeavours must be, not to remedy the evil which water drainage originates, but to prevent its formation, or to cut it off at its source. And surely, when the Commissioners now appointed to inquire into the pollution of rivers see that this can be effected, they will recommend such prevention. And the thing certainly can be done. Every house, not even excepting those in some of the most wretched and crowded parts of large towns, may, with ease, and without public works, and without offence, deodorise and remove effectually and completely its privy soil and all greasy matter.

Let the method, which I have proposed, and which is now one not of theory and reasoning, but of large experience, be fairly looked at, and it must be accepted, first, for its very simplicity; then for its effectual prevention of nuisance and evil; then because of its application to detached houses in the country, and in any situation, as well as to towns and to houses by rivers and streams; and lastly, for the very important consideration of its saving to the country millions of tons of most valuable manure, and at the same time preventing the enormous expense of drainage and drainage improvements.

At the close of my evidence before the Rivers Commission (January, 1866), I summed up the statements I had made in nearly the following words: "So long as water is used in closets the pollution of rivers can never, to any great extent, be prevented: for in the neighbourhood of very few towns can land be found over which to send the sewage. By the use of earth in the way proposed the main evil is cut off, and provision can easily be made for lesser evils. Water cannot deodorise an urinal. I appeal to every railway station in the country. By the use of earth the deodorisation may be perfect. Water cannot be used in sick rooms nor in the wards of hospitals. The earth commode can entirely banish foul smells from both."

For dry and sifted surface earth is the agent that, for these purposes, is to be substituted for water. The extent of the capabilities of such earth, both for absorption and deodorisation, I accidentally noticed some years ago; and the truth and correctness of my observations have since been proved by daily experience. I have also ascertained that various subsoils, especially clays, are equally efficacious as deodorisers, and that they thus produce a valuable manure. After a time, I further observed that if the earth or subsoil used to cover the excrementitious matter be intimately mixed with

the same, not only is all offensive smell and offensive appearance removed, but if the mixed mass be dried and sifted it is capable of repeated action, and that to such an extent that in a closet manufactured for the purpose I have used the same earth *ten times*, and with equal efficacy the last time as the first.

I further ascertained, what the experience of several years has fully confirmed, that one pint and a half of dry sifted earth is sufficient for each use of such a closet. And I may here observe that when the late Henry Austin, Secretary to the Commission on the Utilisation of the Sewage of Towns, heard me state this, and the fact of repeated action, and saw the great simplicity of the machinery for closets, he said to me, "You have now, indeed, solved this vexed question." And he obtained from me a paper on the subject, which he wished to have inserted in the first report of that commission.

Here, then, is an agent of a most important character in the work of cleansing houses and towns. Its advantage over water for such a purpose is complete. Water is only a vehicle for removing it out of sight and off the premises. It neither absorbs nor effectually deodorises. It rather—both in cess-pools and in sewers—aggravates the offensiveness by the fermentation which soon sets in, and is often repeated; and further, it dilutes and wastes a most valuable manure. Whereas dried surface-earth, or subsoil, both absorbs and deodorises the most offensive matter, and that almost instantaneously; and under such circumstances as those narrated, it seems to preserve its full value for agricultural purposes.

After the first edition of this pamphlet was in type, my attention was called to two papers by Professor Way, in the "Royal Agricultural Journal," on "*The Power of Soils to absorb Manure.*" The very interesting observations and

experiments detailed in those papers were directed to a different object from mine, namely, the cultivation of the soil, rather than the deodorising and removing of offensive matters. But the power or capability of soil observed by that gentleman, and by the Rev. A. Huxtable, and Mr. H. L. Thompson, to whom he refers, is clearly the same as that which, from a different point of view, and especially *in its repeated action*, had thus been observed by me. This *repeated action*, however, so far from having been previously known, was doubted, on the appearance of my pamphlet, by one of those gentlemen. The correctness of my observations and experiments was questioned; and a gentleman was sent to inspect the mass of manure on my premises. About three tons of earth had been sufficient for fifteen persons for seven months. He found the last portion of it used for the fifth time, lying as it was left at six A.M. that same day. He went into the shed at one P.M. He handled it, and smelt it without being able to perceive the slightest offence, and even took back with him, in his carpet-bag, about one pound weight of it in a deal box, with a loose cover tied round with a string. Since that time an engineer's clerk sent from London to inquire into the working of earth-closets, and seeing some earth lying on the floor of the shed, thrown out only two hours before from the closet fitted with a mixing screw,* took a portion of it, and having folded it in some brown paper, put it into his pocket to carry back to town.

Now, I wish it to be observed, that it is this capability of repeated use and action which renders the employment of earth so feasible for the removal of offensive matters in towns: first, because of the much smaller quantity of earth

* This, from the great power required to work it, and for other reasons, has since been disused.

required for a given time; secondly, because of the value of the manure being thus compressed into a lesser bulk; and, thirdly, because of the expense and trouble of carriage and removal being thus proportionately reduced.

With reference to the value of the manure which may thus be produced, I have, since the publication of my first edition, received much information, and made a few experiments, some details of which I now give.

One of the most intelligent men of business in the South of England, well known for the extent and correctness of his statistical information, on reading my pamphlet, said to me: "When you reprint it, show the public what they are throwing away—and spending millions to throw away—and the greater and most valuable part of which this method of yours will save."

The substance of the statements and calculations he then gave me was as follows:—

It is the result of the large, long-continued, and thoroughly practical experiments of intelligent farmers, that one-third of the value of the corn with which they feed their cattle goes on to the ground in the form of manure. Let this fact be applied to human beings congregated in a town of 7000 inhabitants; and take as the average value of the meat and corn food consumed by each individual 2*s.* a week, or 5*l.* a year. Instead of one-third of the value of this for the manure produced, take, if you please, only one-fifth—or 1*l.* a head. That town, then, on the present drainage system, is throwing 7000*l.* a year into the river, and the metropolis throws no less than 2,500,000*l.* into the Thames, and is now expending 3,500,000*l.* on works that shall throw it away more completely in the marshes of Erith.

It has been doubted by some, but without any assigned reason for their doubts, whether the earth, absorbing and deodorising the soil at once, and before fermentation sets in,

receives and retains the value of the manure. I think the following experiment will prove a satisfactory settlement of any such doubts. A farmer in my parish put in some Swede turnips late in the spring, *with some of the earth* mentioned above *as having been used five times in removing the soil of a family for seven months, averaging, during that time, fifteen persons.* It had lain in the shed full seven months after being used. The quantity applied to the ground was one cwt. to a quarter of an acre. Equal quantities of superphosphate were applied to fifteen equal spaces of ground. The crop, though injured by the vast growth of weeds during a rainy summer, was one of the best in the neighbourhood. And though all that I had looked for was, that the piece manured with the mixed earth should be as good as those which had received the superphosphate, yet through the whole of their growth there could be no doubt as to the superior healthiness and strength of the plants grown in the former; and *on pulling them, their roots weighed full one-third heavier than the others.* The following year another farmer substituted earth which had passed seven times through an earth-closet, for crushed bones, at the rate of one cwt. per acre. The ground was poor, the crop white turnips, and several good judges expressed the opinion that a finer crop could scarcely have been grown. Mr. Dickinson, of New Park Farm, Hampshire, has asserted that such a mixture is equal to crushed bones in power, more immediate in its action, and that the benefit lasts three years in the ground. I may here add, that from information received from the Rev. J. J. Irwin, D.D., Chaplain at Hongkong, I learn that the practice of deodorising ordure by means of dry earth, and of using it so mixed as manure, has existed amongst the Chinese in the south of China from time immemorial. He saw lying under the walls of a town thousands of tons of such substance, waiting for shipment

in lighters up the river. It is to that people of such value as to be an article of commerce. Why not to us in England?

Now, from a town of 7000 people might be procured, with ease and without offence, and with great advantage to the health, comfort, and morals of many, at least 3000 tons of such manure a year. And a company allowing even 10*s.* a head for the purchase of the soil from the inhabitants, and 10*s.* a ton for carrying the earth in and out and drying it, and then selling it at 3*l.* instead of 6*l.*, 7*l.*, or even 8*l.* a ton, the price of superphosphate, or double those sums, the price of guano, would make a profit not to be despised. In a communication to the "Gardeners' Chronicle" (January 26, 1861), I put the purchase of the soil at 2*s.* 6*d.* a head, and so low a price as this numbers of the working classes in towns would gladly accept. There is no sufficient reason, however, that it should be so low. But set even this as gain or help against the increase in rental, which may be occasioned in some places by the drainage system, of 6*d.* or 9*d.* a week on the poorest dwellings, and how great in this case is the advantage!

I give another instance of what may be saved or gained by the public. A county gaol may have an average of 150 prisoners and officials. The water-closets for their convenience may be 60 in number, and the expense of keeping them in order is not less than 50*l.* a year. Now, an apparatus for an earth-closet—for which a patent has been obtained—is so simple in its machinery, that 60 of them might be kept in order for less than 5*l.* a year. And if to the 45*l.* a year thus saved, the value of the manure, according to the calculation above, be set at 150*l.*, there would be a gain to the county of about 200*l.* a year. Extend this to barracks and to hospitals, with their 200, 800, or 1000 inmates, and do I err in adding *wealth* to health in my title, as expressing the result to the country of the general adop-

tion of the plan here proposed? Substitute moreover, in the case of barracks, that which this plan renders perfectly safe and practicable—a sufficient number of separate closets in the immediate proximity of the sleeping-rooms and stables, instead of the offensive crowding of such places, erected, because of their offensiveness, at a great distance from the buildings, and I might add, to *health and wealth, comfort and decency.*

I have within the last fortnight (September 5th, 1864) received information that, led by a paper of mine in the Journal of the Society of Arts for May, 1863, Dr. Mouat, Inspector-General of Gaols for Bengal, has introduced the dry-earth system into that country, and that in more than 200 gaols and other public buildings it was in June of this year fully and successfully established. It has since been introduced also into the barracks of the Indian army.

I have recently seen Dr. Mouat's report on the gaols of the Lower Provinces of the Bengal Presidency for the years 1864—1865, from which I make the following extracts:—

"Section 77. Dry Earth Conservancy.—The papers printed in the appendix show that the introduction of the dry earth conservancy system of the Rev. H. Moule has been attended with success; that it has removed the greatest defect in the sanitary arrangements of Indian prisons; that it has led to a remarkable change in the condition of such extremely unhealthy gaols as Monghyr and Gya; and that it is, without exception, the greatest public benefit conferred by a private individual in a matter so essential to public health that I am acquainted with. The brief notices on the subject were prepared by Dr. Fawcus from the returns submitted, and are sufficient to show the great benefits of the system. The report of Dr. Bholamuth Bose, the Civil Surgeon of Furreedpore, who is himself a learned Hindu, is extremely interesting, in proving that it was early known

to his co-religionists, and that it contains nothing contrary to Hindu practice." . . .

"The merit of the introduction of the dry earth system, as now practised in every part of British India and the Straits' Settlements, is entirely and exclusively due to the Rev. Mr. Moule, whose Paper in the Journal of the Society of Arts I presented to the Indian Gaol Committee in March, 1864, by whom it was circulated throughout India." . . .

"Both (the Punjab plan and one previously in use in Bengal) are infinitely inferior to the real dry earth conservancy system. Hence it is, in my humble judgment, impossible to overestimate the benefits that will result from the labours of the Rev. Mr. Moule in this important branch of hygiene. It has already, in the infancy of its introduction into Bengal, wrought wonders; and I have little doubt that its economic advantages will hereafter be as great as its immediate influence in promoting the comfort and improving the health of all public institutions in which it is properly used."

The introduction of earth for this purpose into houses, whether in town or country, even with the large allowance of one ton to every five individuals, for twelve months, would be as cheap and easy as the present large supply of water.

The arrangement for the removal of the stable manure of the Cavalry Barracks at Dorchester (and I suppose that similar arrangements exist in other barracks) will serve to illustrate the readiness with which companies might be expected to supply earth for closets in towns, and the comparative facility of its removal. The farmer commonly supplies the straw required in the barracks free of all charge, and on the sole condition of receiving in return the manure made by it. For every load of straw, he in general receives back three loads of manure. Now that load of straw would sell for at least 30*s*. Add to this value, then,

the wages of a man and boy, the use of horses, and the wear and tear of waggons, and each load of manure must cost at the least 12*s*. And I once convinced a farmer, who was rejoicing in having obtained the privilege of thus supplying straw to one wing of these barracks, that in his case in the carriage of the straw to the stables, and of the manure from thence to his fields, and in manuring with it 100 acres at the rate of ten loads to an acre, he would expend more than 500*l*., and that three horses would have to travel, in performing this task, 2000 miles. Now, one load of the manure made in the way proposed in this pamphlet, would be equal to 15 or 20 of stable manure, and the earth or subsoil might in general be supplied for it at no other cost than that of labour and carriage.

I ought here to add, that in the country, or on premises in a town with no more than a good-sized court, almost all the liquid sewage may be removed by means of earth. And in the cases in which much dish water is produced, the manure thus made will be little, if at all, inferior to the other. There should be a dish-shaped tank, capable of containing two or more barrows of dried earth, according to the size of the family, and to the frequency or infrequency of its removal for drying. It should be protected from the rain; and if the earth be removed before it be saturated, there will arise from it, though close to the house, neither offence nor injury. A covered shed for the purpose of drying the earth would in some cases be convenient; or a common tub might be placed near the door, half filled with earth, into which the sink-water might be poured.

But the efficiency of this agent will perhaps be most apparent, though not really greater, in public than in private establishments, and especially in the removal of *a great public nuisance, and the relief of a great public want;* to both of which it fully opens the way. The nuisance is the horrid

offensiveness of urinals at railway stations, and at schools, and other public places. The want is that of urinals and public closets in London and our large towns. Indeed in almost every town and large village the erection of these would greatly promote habits of cleanliness and decency. As to railway stations, I am persuaded, that by the proper use of dried earth in the urinals and closets, and by the adoption of a very simple mode of drying the earth, while these urinals and closets would thus be kept perfectly free from offence, the value of the manure saved would be great.

And as to urinals and public closets for London and large towns, if by the mode referred to the mixed earth be dried at a proper temperature, and the full value of the manure be thus preserved, then by a proper selection of sites a company might fully relieve this want, not only without offence, but with a vast pecuniary profit. One of the most important features of the plan is this, *that it is as easily applicable to the most wretched and crowded parts*, where humanity most loudly demands such relief, as to any other. And if, either by the Metropolitan Commissioners, or by a company formed expressly for the purpose, there should be undertaken, in addition to a sufficient number of such establishments, the removal by the same process of the soil of barracks, hospitals, schools, and other public institutions, far more would be done to relieve the Thames nuisance, and the sewer and gully-hole nuisance, than can ever be effected by any plan hitherto devised--far more to prevent disease and promote health. A million of the population of London might soon and easily be thus reached, with an outlay, I believe, of far less than a million sterling, returning a gross income, too, of nothing less than that sum. If the working expenses be put down even at half of this, then a profit might be looked for of half a million, with increased relief to health and morals, which, to say the least, is something better than

£3,500,000 spent on works which shall make no return whatever.

The economical view of this question is of vast importance. Public works *press more heavily on the working classes than is commonly known or imagined;* and while relieving or removing one great evil, these works may occasion or aggravate others. Of this Boards of Health and their promoters have not in carrying out the drainage system been sufficiently considerate. Whilst honestly endeavouring to relieve a confessedly great source of physical and moral evil in the improper or insufficient mode of removing excrementitious matter, they have not foreseen or considered how the drainage rate increases the rent of the working man. The ordinary allowance for rent out of a man's income is 10 per cent. But in the case of many a working man in this town the rent he has to pay is 25 per cent., 2*s.* or 2*s.* 6*d.* out of 9*s.* or 10*s.* a week; and to this a water and drainage rate may add 3*d.*, 6*d.*, or 9*d.* a week. And as wages do not increase in proportion, the necessity is thus originated or increased of taking in lodgers, and generally without regard to character, in order to pay the rent. The impure air of crowded rooms becomes thus another or an increased source of physical evil; and the moral evil occasioned by the larger crowding of persons into sleeping-rooms, without distinction of sex, age, or character, is far greater than that physical evil, the remedy of which is sought in the drainage system. It is too late, perhaps, to correct these evils in the metropolis and in other places into which this system has been introduced. And yet, from what has been stated, much may, I think, be done to relieve these evils even there. But on this ground, and on behalf of the working classes, a warning voice may well be raised against the water system of sewerage in those towns in which it has not yet been adopted. And if the principle and plan which I

have developed be correct, the inhabitants of such towns should be further told that the scheme for the general adoption of that principle and plan in any particular place *requires no great and expensive public works, such as large and extensive sewers;* it may be quite experimental in its commencement; gradual in proportion to success; involving therefore no great risk; and, if successful, increasing in every such place the health and wealth of the community, without aggravating the poverty of the poorer classes. Let me add to this, that it is the only plan which can with any degree of economy and comfort and safety be adopted by all classes in detached houses and villages, or in towns which are so situated as to render the water-sewerage system either inefficient, as far as it goes, or even impracticable. In watering-places, for instance, what outlet for filth can you get by means of water without spoiling the bathing? In towns, situated either, as some places in the neighbourhood of London, too high for a supply of water, or as those in the fen districts of the country, with too large a supply and no outfall, how can water be used for the purpose of sewerage? or, if used, how can injury and increased nuisance be escaped? Or again, if recourse be had to the system of tanks, force-pumping, and irrigation of the land, how enormous for this the outlay! How almost impossible to make men pay even a small sum for that of which you are glad to get rid, and how vast in that case the increase of burden on the working man! Now in all such places the earth-system is just as available and efficacious as in any other; and the disposal and sale of the manure not being necessarily contingent on the use of it in the immediate locality, it would not be sold at a disadvantage. In such towns and situations, then, unless the evils and abominations of the vault and cess-pool are to be continued, the earth-system must be adopted.

I cannot conclude without pointing to the immense

benefit and comfort to be derived from the adoption of commodes on this earth-principle in sick-rooms and in the wards of Hospitals, and in connection with the large Dormitories of Public Schools or of Unions. If used also as urinals in the wards of Hospitals, or in rooms in which numbers sleep, very great relief, by the prevention thus of the spontaneous fermentation of urine, would be afforded to the impurity of the air in such rooms. And in connection with this I may state, that more than one medical man of large practice and experience, when looking at my principle and plan from his own point of view, has remarked, that if the scheme could be generally adopted, and one-half of the probable results should be verified, more would be effected by it for the prevention and check of disease and sickness, and for the improvement of health, than Jenner has effected by the discovery of vaccination.

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MOULE'S PATENT EARTH CLOSETS.

HOW *NOT* TO PROPAGATE CHOLERA AND FEVER.

TO THE EDITOR OF THE "TIMES."

SIR,—Since the philosophic mind of the late Dr. Snow first demonstrated the propagation of cholera through drinking water, instances to the same effect have so greatly multiplied that the public mind, it is to be hoped, will become both well informed and well alarmed on the subject. The Registrar-General makes useful reference to it this week, and the observations of your correspondent "Q." are important.

But what is to be done? Under the existing system of house and town drainage the filthy refuse of every dwelling is cast into the underground drains, and from that moment all control over its destiny and condition is lost; it may only poison the air, and eventually the river, it cannot do less; it may accumulate and choke up a conduit, and then when opened up to remedy the evil its emanations may only produce temporary indisposition to the unfortunate workmen, and nearly kill the servant ordered to oversee the work; such a case has actually occurred within the last week, and the servant is still in considerable danger of his life. Lastly, it may soak into a well or mingle with a river and carry death to a whole community.

Destruction of the material by chemical means may answer where it is regular and constantly done; but when will that be? One omission may explode the magazine.

Can it be that the difficulty of working this problem, "How to get rid of the excretions of man," exists in nature and Providence? Is it possible that the great system of nature, otherwise so full of harmony and provision, in this particular breaks down, and exhibits an unpreparedness and incapacity of action? On the contrary, we all know better, we know that the earth is the natural deodorizer and transformer of all materials which to our senses have become hateful, and to our health inimical. Mother Earth receives everything we choose to bring

to her, instantly removes its ugly features, and in good time returns it to us in forms of beauty, goodness, and convenience. This we all know, and methods of employing this beneficent arrangement of Providence have been devised, more or less practical and efficient; notwithstanding, we persist in doing the wrong thing, as if, by obstinacy, and the expenditure of more and more money, we could eventually bend the laws of physics to our purpose, and make tenacious solids flow in pipes like water.

But, Sir, I should not venture to trouble you with an iteration of complaints that now are commonplace, but for the fact that I have recently seen the right thing done successfully and effectually. Being on a visit in the country, I was invited to inspect a small infirmary for the sick poor on the estate of the proprietor. In all respects its arrangements appeared to me excellent, but especially in the fact that it possessed no water-closet. In place thereof I found an earth closet, which in appearance, method of using, comfort, and convenience was the counterpart of an ordinary good water-closet, with the difference that each use of the handle supplied the pail beneath with a certain quantity of dry earth, which perfectly absorbed and deodorised whatever material had been cast into it. The attendant in charge assured me that its use had been most salutary, agreeable, and convenient. At suitable times the pail was taken to a distance, and its contents buried in a pit for manure. The dry earth was supplied through a hopper above and behind the closet, and worked easily with each movement of an ordinary closet handle.

It may be said, "This is all very well for the country, but what of the town?" I reply that, in my opinion, it is just as practicable for one as the other. Let the Legislature simply make it penal to pass any solid or offensive matter into the existing drains or sewers, and the following results may be achieved:—

Our dust contractors will enlarge their machinery. If they do not find it expedient to pay each householder for his refuse, which I think they would, I am certain they would find their reward in supplying everything the householder would need to carry out and carry on the change. The contractor would supply for every closet in each house he contracted for three pails of metal. Two he would leave at the house, the third he would send in the early morning filled with powdered earth. The same hand that deposited this in the area would carry away one of the two previously in the house, which, having been used the previous day, was at night replaced by the second one, and then placed in the area ready for the early morning removal just described.

Thus, by a system unobtrusive, unseen except by the early risers, and perfectly inoffensive, would the source of so much disease, decay, and misery be abolished.

Thus, too, would our fields be replenished, and many a barren waste *be made "to blossom* like the rose."

Moreover, our poor ill-used river would not only cease to be defiled, it would cease to be poured out and wasted with the prodigal hand that makes us now contemplate another batch in the tinkered machinery, an aqueduct from Wales, or from Windermere. A grand thing for the engineers, but one from which the taxpayers for a yet unfinished high, middle, and low level drainage may prayerfully hope to be delivered.

I remain, Sir, your obedient servant,

THOS. HAWKSLEY.

70, Brook Street, Grosvenor Square,
September 13, 1866.

TO THE EDITOR OF THE "TIMES."

Sir,—The process of deodorisation by earth, referred to in Mr. Hawksley's letter in the "Times" of Friday last, may be seen in full operation on Baron Rothschild's estate here.

Any one taking an interest in the improvement of the condition of the poor, and the state of our rivers, would do well to satisfy himself of the truth of Mr. Hawksley's views by a personal inspection of the whole process.

In the earth sheds here he may see excrementitious matter on its first removal from the closets, and in barrels, dried and ready for the corn and turnip drills. In all its stages it is perfectly inodorous, even when subjected to the fiercest summer heat.

The deodorisation may be effected either by the rough and ready application of a shovel-full of garden earth every day, or by the more refined and very effective apparatus patented by the Rev. H. Moule. It is with this little machine that the Halton closets are fitted; they are cheap, self-acting, and cannot get out of repair.

To the benefit conferred by them on the poor the cottagers themselves will speak. There are yet enough of the old cesspools remaining to enable a visitor to appreciate at a glance the perfection of the earth closet system.

I can see no reason why this method should not be adopted by towns. It is inexpensive and most efficacious, requiring no better engineer than a journeyman carpenter. The earth may be taken in at long intervals and stored like coals, while the cesspools might remain unemptied for three, six, or twelve months, according to their size or the convenience of the tenant, without causing the smallest annoyance.

With rare exceptions, existing waterclosets and cesspools are available for the earth method, and are readily adapted at a very trifling expense.

I am, Sir, your obedient Servant,

J. JAMES.

HALTON, WESTON TURVILLE, TRING.
September 17, 1866.

TO THE EDITOR OF THE "TIMES."

SIR,—At this critical time, when we are in momentary danger of outbreaks of cholera at our doors, I thought it desirable not to lose a moment in accepting the challenge offered by Mr. James in his letter in the "Times" of yesterday, and I rode across the hills to Halton this morning for the purpose of investigating the truth of the assertion he had made.

I inspected the earth sheds and saw the process in every stage. I put my nostrils into close contact with soil which had been taken from the closets this morning, and I took up some which had been out no more than a fortnight without soiling my hands, and lastly, I have come away with a small parcel of the dried soil in my pocket, having during the whole investigation met with nothing in the smallest degree disagreeable. I have no hesitation in saying that any gentleman who follows the example of Baron Rothschild in adapting this process to cottages will confer the greatest possible boon upon the poor, and I shall myself have no hesitation in recommending not only the process itself, but the little machine invented by Mr. Moule, to anyone seeking my advice.

In small towns, at least, it must be of easy and inexpensive application, while the benefit to health will be great indeed.

I am, Sir, your obedient servant,

GEO. FAITHORN,
Medical Officer of the Chesham District of the Amersham Union.

September 10, 1866.

MOULE'S PATENT EARTH CLOSET COMPANY LIMITED.

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MANAGER, T. M. EVANS.